Sky and TELESCOPE

INDEX to Volume XXIX

January to June, 1965

Titles

American Astronomers Report—
Centimeter Radiation from Planets, 218
Cosmic Radio Observations at 11.4-Meter Wavelength, 221
Earth's Magnetic Tail, The, 357
Helium and the Galaxy's Age, 219
Icy-Conglomerate Moon, 143
Motions of Stars in Messier 37, 141
New Radar Studies of Venus, 356
Nova Herculis 1963, 142; correction, 275
Pluto's Rotation and Diameter, 141
Radio Source Spectra at Centimeter Wavelengths, 221
Spectroscopic Binaries in the Pleiades, 356
Supernova in 1006, 218
Zeta Tauri—A Star in Eruption, 219
American Manned Spaceflights Resume, *Raymond N. Watts, Jr.*, 279
Argelander and the BD, *Alan T. Moffet*, 276
Astronomical Notes from Hamburg—2—
Astronomical Constants, 19
Variable Star Notes, 21
Crisis at Allegheny, 135
December's Well-Observed Lunar Eclipse, 72
Distance Modulus, *George S. Mumford*, 274
Dynamical Model for Demonstrating Satellite Motions, A, *Leon Blitzer*, 16
Europe's Second Largest Schmidt Telescope, *Åke Wallenquist*, 136
Events of 1965 in the Graphic Time Table, 33
Evolution of Galaxies, The, *Thornton L. Page*, I, 4; II, 81
Five More Amateur Observatories, *W. E. S.*, 284
Giant Dish Antennas for Caltech's Observatory, 199
Harvard Observatory's New Patrol Cameras, *Hector C. Ingrao*, 200
In-Flight Results from Mariner 4, *Raymond N. Watts, Jr.*, 359
Infrared Spectroscopy With an Interferometer, *Peter B. Boyce* and *William M. Sinton*, 78
In-Shop or On-Site Figuring of Large Telescope Mirrors? *D. S. Brown*, 350
Japanese Plans for May's Eclipse, *Kuniji Saito*, 149
Kitt Peak 150-inch Telescope, The, *David L. Crawford*, 268
Light Elements in Stellar Atmospheres—I, *Margherita Hack*, 347
Long-Range Planning for American Astronomy, 3
Lunar Results from Rangers 7 to 9, *Gerard P. Kuiper*, 293
Mars Observations Wanted, *Raymond N. Watts, Jr.*, 150
New Arecibo Findings About the Planets, 339
New Observations of AE Aquarii, *Merle F. Walker*, 23
Painting the Eclipse, 71
Possible Occultation by the Planet Pluto, A, *Ian Halliday*, 216
Practical Astronomy from Shipboard, *William S. von Arx*, 340
Problems of Constructing Large Telescopes, *David L. Crawford*, 354
Radio Telescope for Amateurs, A, *Joseph K. Alexander* and *Larry W. Brown*, 212
Ranger 8 Lunar Reconnaissance, *Raymond N. Watts, Jr.*, 205
Relativistic Astrophysics, *Louis C. Green*, I, 145; II, 226
Roster of Space Activity, A, *Raymond N. Watts, Jr.*, 28
7th-Century Korean Observatory, A, *Po Sung Kim*, 229
Solar Energy Spectrum, The, *Harriet H. Malitson*, 162
Symposium on Abundances of Elements in Stars, *Bancroft W. Sitterly*, 11
Titan and Atlas-Centaur Trials, *Raymond N. Watts, Jr.*, 95
Two Peruvian Solar Eclipses, *Edward M. Brooks*, 86
U. S. Eclipse Expeditions, 267

Authors

Aime, Frank L., A Massive Well-Equipped 16-inch Reflector, 242
Alexander, Joseph K., and *Larry W. Brown*, A Radio Telescope for Amateurs, 212
Alter, Dinsmore, letter, 215
Ashbrook, Joseph, Astronomical Scrapbook, 92 217, 353
book review, 106
R Lyrae: A Semiregular Variable, 258
Ashbrook, Martha D., book review, 238
Batten, Alan H., letter, 153
Blitzer, Leon, A Dynamical Model for Demonstrating Satellite Motions, 16
Bortle, John E., letters, 14, 349
Both, Ernst E., book review, 373
Botley, Cicely M., letter, 85
Boyce, Peter B., and *William M. Sinton*, Infrared Spectroscopy With an Interferometer, 78
Boyko, Anatole, letter, 349
Brandon, D. F., Color-Film Processing, 187
Brooks, Edward M., Two Peruvian Solar Eclipses, 86
Brown, D. S., In-Shop or On-Site Figuring of Large Telescope Mirrors? 350
Brown, Larry W., see *Alexander, Joseph K.*
Burkhead, Martin S., An Unusual Lunar Eclipse Photograph, 389
C. A. F., see *Federer, Charles A., Jr.*
Carlson, Eric, letter, 215
Code, Arthur D., book review, 233
Cox, Robert E., book review, 170
conductor, Gleanings for ATM's, 44, 112, 176, 242, 318, 380
Detailed Instructions for an Oblique Reflector, 248
Crawford, David L., The Kitt Peak 150-inch Telescope, 268
Problems of Constructing Large Telescopes, 354
Davis, William F., Jr., Rapid Polar Adjustment of an Equatorial Mounting, 180
DeVany, Arthur S., A Schmidt-Cassegrain Optical System with a Flat Field—I, 318 (correction, 384); II, 380
Drohomer, William, A Straight-Stroke Grinding Machine, 176
Dunham, David W., Two Occultations of Sigma Sagittarii, 330
Everhart, Edgar, An Observatory for Students, 289
Federer, Charles A., Jr., Rambling Through . . . (current month) Skies, 64, 128, 192, 260, 332, 396
Firsoff, V. A., letter, 14
Firth, Mrs. Mary L., Polaris Astronomical Society, 30
Flathman, Robert F., An M-17 Elbow Telescope Modified to 25 Power, 178
Folsom, Franklin, letter, 278
Forczyk, Stephen, and *Frederick W. Walczyk*, Durfee Observatory in Massachusetts, 361
Genatt, S. H., letter, 85
Glenn, William H., Meteors, 64, 258, 331
The Sun, Moon, and Planets This Month, 63, 127, 191, 259, 331, 395
Gordon, Rodger W., letter, 153
Green, Louis C., Relativistic Astrophysics—I, 145; II, 226
Haas, Walter H., book review, 167
Hack, Margherita, Light Elements in Stellar Atmospheres—I, 347
Hale, Arthur B., letter, 14
Halliday, Ian, A Possible Occultation by the Planet Pluto, 216
Herring, Alika K., Observing the Moon, Marius, 59; Milichius, 252
Houston, Walter Scott, Deep-Sky Wonders, 58, 124, 186, 253, 328, 390
Hujer, Karel, letter, 153
Ingrao, Hector C., Harvard Observatory's New Patrol Cameras, 200
Izsak, Imre G., book review, 41
J. A., see *Ashbrook, Joseph*
Keator, Frederic W., letter, 215
Kim, Po Sung, A 7th-Century Korean Observatory, 229
Knuijt, Jerome J., An Observing Platform, 231
Komorowski, Ted R., letter, 215
Kuiper, Gerard P., Lunar Results from Rangers 7 to 9, 293
L. J. R., see *Robinson, Leif J.*
Lindsay, Wesley N., A Novel Dual-Field 8-inch Telescope, 112
Malitson, Harriet H., The Solar Energy Spectrum, 162
Mallas, John H., book review, 313
Martz, Roy, letter, 349
McAllister, Robert D., The Moon and Distant Hills, 391
McLennan, Ian C., letters, 85, 278
Meeus, Jean, letter, 278
Menzel, Donald H., book review, 39
Michaud, Michael A. G., Amateur Astronomy in Pakistan, 155
Moffet, Alan T., Argelander and the BD, 276
letter, 85
Moore, Patrick, letter, 215
Mumford, George S., book review, 168
Distance Modulus, 274
News Notes, 26, 88, 156, 223, 281, 345
O'Dell, C. R., letter, 85
Omer, Guy C., Jr., book review, 234
Osypowski, Thomas, see *Pope, Thomas*
Page, Thornton L., The Evolution of Galaxies—I, 4; II, 81
Pearlmutter, Arthur E., book review, 309
Petri, Winfried E., book review, 375
Petrie, William, book review, 312
Pinson, William H., Jr., book review, 37
Pokorny, Zdenek, letter, 153
Pope, Thomas, and *Thomas Osypowski*, High-Resolution Photography, 52
R. E. C., see *Cox, Robert E.*
Reese, Elmer J., see *Smith, Bradford A.*

Rizzo, Patrick V., book review, 38
Robinson, Leif J., book reviews, 38, 168
Late-1964 Meteor Shower Roundup, 120
SZ Hydrae—An RR Lyrae Variable with Changing Period, 126
Rodger, Dave A., Some Observations of Noctilucent Clouds, 250
Rost, Carlos E., book review, 103
Sacharow, Allan, Telescope Making at Bridgeport, 154
Saito, Kuniji, Japanese Plans for May's Eclipse, 149
Shawcross, William E., Five More Amateur Observatories, 284
Simple Antennas for Radio Time Signals, 326
Simonsen, Wilhelm S., letter, 278
Simpson, Clark C., An 8-inch Reflector with Remote-Reading Circles, 44
Sinton, William M., see *Boyce, Peter B.*
Sitterly, Bancroft W., Symposium on Abundances of Elements in Stars, 11
Smith, Bradford A., and *Elmer J. Reese*, A Jovian Atmospheric Feature of Special Interest, 118
Smith, Harlan J., letter, 215
Smith, James Mitchell, Ohio Telescope Sought, 155
Solberg, H. Gordon, Jr., Photographing the Zodiacal Light, 323
Spinrad, Hyron, book review, 374
Sternig, John, book review, 104
Stokes, Arthur J., Ohio Turnpike Meeting, 231
Sutherland, W. H., Britain's Second National Convention, 30
Thurn, Vincent W., letter, 278
Turner, Pete D., Venus-Regulus Conjunction, 60
van de Kamp, Peter, book review, 36
van den Bergh, Sidney, letter, 14
Van Flandern, Thomas C., Extreme Grazing Occultations, 386
Veio, Fredrick, Star Trails and Seeing, 122
von Arx, William S., Practical Astronomy from Shipboard, 340
W. E. S., see *Shawcross, William E.*
W. H. G., see *Glenn, William H.*
Walczyk, Frederick W., see *Forczyk, Stephen*
Walker, Merle F., New Observations of AE Aquarii, 23
Wallenquist, Ake, Europe's Second Largest Schmidt Telescope, 136
Watts, Raymond N., Jr., American Manned Spaceflights Resume, 279
book review, 377
In-Flight Results from Mariner 4, 359
Mars Observations Wanted, 150
Ranger 8 Lunar Reconnaissance, 205
Roster of Space Activity, A, 28
Titan and Atlas-Centaur Trials, 95
Wolbach, John G., book review, 235
Yajko, Robert A., Pennsylvania Students Build 12½-inch Reflector, 288
Young, Andrew T., letter, 153
Youngclaus, Warren C., Inexpensive Telescope Mount, 117

Departments and Features

Amateur Astronomers—
AAVSO Spring Meeting, 154
AL and ALPO To Hold Dual Convention, 155
Amateur Astronomy in Pakistan, 155
Amateur Briefs, 30, 91, 154, 231, 289, 361
Astronomical Motion Pictures, 30
Britain's Second National Convention, 30
Durfee Observatory in Massachusetts, 361
Northeast Meeting, 155
Northwest Region Meeting, 155
Observatory for Students, An, 289
Observing Platform, An, 231
Ohio Telescope Sought, 155
Ohio Turnpike Meeting, 231
Pennsylvania Students Build 12½-inch Reflector, 288
Polaris Astronomical Society, 90
Summer Meetings for Amateur Astronomers, 288
Summer Positions in Astronomy, 90
Swiss Convention, 286
Telescope Making at Bridgeport, 154
Astronomical Scrapbook—
Inventiveness of Henry Parkhurst, The, 217
"Long Night" of Selenography, The, 92
Tycho Brahe's Nose, 353
Books and the Sky—
Amateur Astronomer and His Telescope, The, Günter D. Roth, 309
Astronomers, The, Colin Ronan, 375
Astronomy with Binoculars, James Muirden, 38
Binoculars and All-Purpose Telescopes, Henry E. Paul, 170
Earth, Moon, and Planets, Fred L. Whipple, 167
El Planeta Marte, Elpidio Lopez L. and Francisco J. Escalante, 103
Exploration of the Universe, George Abell, 233
Field Guide to the Stars and Planets, A, Donald H. Menzel, 36
International Auroral Atlas, International Union of Geodesy and Geophysics, 312
Introduction to Astrophysics: The Stars, Jean Dufay, 168
Introduction to Satellite Geodesy, Ivan I. Mueller, 41
Light: Our Bridge to the Stars, John Rublowsky, 38
Meteorites, Fritz Heide, 37
Modern Theories of the Universe, James A. Coleman, 234
Photographic Star Atlas, Part III—Southern Sky, Hans Vehrenberg, 168
Photographic Study of the Brighter Planets, A, Earl C. Slipher, 373
Pioneer Astronomers, Navin Sullivan, 238
Relativity and Common Sense, Hermann Bondi, 234
Revue des Constellations, R. Sagot and J. Texereau, 313
Books and the Sky (cont.)—
Short History of the Universe, A, Arthur S. Gregor, 104
Solar Energy, Hans Rau, 39
Solar System Astrophysics, John C. Brandt and Paul W. Hodge, 374
Space Physics, Donald P. LeGalley and Alan Rosen, editors, 235
Survey of the Moon, A, Patrick Moore, 106
Telecommunication Satellites, K. W. Gatland, editor, 377
Celestial Calendar—
Andrew's Star: A Suspected Variable in Auriga, 62
Asteroid Double Feature, 393
Daylight Occultation of Jupiter, 394
Eclipsing Star BV 382 Cephei, 393
FL Lyrae: A Variable of the Algol Type, 330
June's Partial Eclipse of the Moon, 395
Jupiter's Satellites, 63, 127, 191, 259
Kappa Geminorum and the Moon, 190
Meteors, 64, 258, 331
Minima of Algol, 62, 127, 190, 259, 331, 394
Moon Phases and Distances, 64, 127, 190, 258, 331, 394
1965 Opposition of Mars, The, 189
R Lyrae: A Semiregular Variable, 258
Solar Eclipse, The, 330
Sun, Moon, and Planets This Month, The, 63, 127, 191, 259, 331, 395
SZ Hydrae—An RR Lyrae Variable with Changing Period, 126
Two Occultations of Sigma Sagittarii, 330
U Coronae Borealis—An Eclipsing Binary Star, 190
Uranus and Neptune in 1965, 62
Variable Star Maxima, 62, 126, 191, 258, 331, 394
Feature pictures—
Double Cluster in Perseus, 138
Lunar crater Aristarchus, 100
Lunar crater Tycho, 368
Front-cover photographs—
Amateur's 8-inch reflector, 1
December eclipse painting, 69
Harvard Patrol Camera, 197
98-inch Mirror in Optical Shop, 337
North America Nebula in Cygnus, 133
150-inch Telescope Model, 265
Gleanings for ATM's—
Detailed Instructions for an Oblique Reflector, 248
8-inch Reflector with Remote-Reading Circles, An, 44
Inexpensive Telescope Mount, 117
Massive, Well-Equipped 16-inch Reflector, A, 242
M-17 Elbow Telescope Modified to 25 Power, An, 178
Novel Dual-Field 8-inch Telescope, A, 112
Rapid Polar Adjustment of an Equatorial Mounting, 180
Gleanings for ATM's (cont.)—
Schmidt-Cassegrain Optical System with a Flat Field, A, I, 318 (correction, 384); II, 380
Straight-Stroke Grinding Machine, A, 176
In Focus, 91, 364
In the Current Journals, 26, 88, 156, 223, 282, 346
Letters, 14, 85, 153, 215, 278, 349
New Books Received, 42, 107, 172, 239, 316, 378
News Notes—
American Astronomer Honored, 223
Artificial Meteors, 26
Asteroid Roemera, 345
Astronomy and Bridge Building, 27
Atmosphere on Io, An? 157
Atmospheric Density at Extreme Heights, 281
Baldet, Fernand (1885-1964), 283
Bright New Variable, 89
Canals of Mars, 88
Can Neutron Stars Be Observed? 345
Closest Approaches of Pluto to Neptune, 157
Clouds of Venus, 224
Coated Grains in Interstellar Space, 18
Columbia Summer Institute, 96
Composite Radio Telescope for the Netherlands, 10
Constancy of the Speed of Light, 204
Continual Creation, 88
Copernican Planetarium Presented to Griffith, 149
Cosmic Ray Pioneer, 94
Cyclic Changes in the Interplanetary Magnetic Field, 22
Czech Sky Mapper, 140
Former Smithsonian Director, 225
Galaxy's Spiral Shape, The, 281
Heart of the Milky Way, The, 282
Honor for Paul Herget, 217
Image Tubes Soon Available, 26
Infrared Glows Around Stars, 158
Infrared Spectrum of Mars, 282
Intergalactic Dark Cloud? 158
Interstellar Lines Observed at Kitt Peak, 225
IQSY Booklet, 77
Irish Planetarium, 283
Izsak, Imre, 345
Joint Eclipse Expedition, 224
Laboratory Simulation of Stellar Spectra, 144
Mass of the Canyon Diablo Meteoroid, 222
Mees Observatory Dedicated, 346
Meteoriticists Meet, 77
Moon's Skin, The, 345
More About Ammonia and Jupiter's Rotation, 88
Nests of Supernovae, 283
New Position of North Magnetic Pole, 224

News Notes (cont.)–
New Test of General Relativity, 156
New Variable Star, 345
Nuclei of Planetary Nebulae, 281
Observing Conditions on Mt. Wilson, 283
150-foot Radio Telescope at Sugar Grove, 346
150-inch Blank Ordered, 140
Origin of Some Iron Meteorites, 282
Planetarium Conference, 140
Planetarium Course, 283
Project Mohole Drilling Site, 355
Radar Reflectivity of Venus, 281
Radar to Distant Mars, 26
"Radio and Radar Astronomy," 10
Radio Studies of Venus, 345
Ranger 7 Lunar Charts Available, 230
Rayleighs in Review, The, 77
Relativity and Astrophysics Symposium at Cornell, 157
Satellite I and Radio Noise from Jupiter, 27
Sodium in the Upper Air, 283
Solar Flare Symposium, 89
Summer Institute, 94
Sun, Moon, and Planets Observed, 158

News Notes (cont.)–
Sunspot Minimum, 158
Supernovae in NGC 3938, 157
Surface Conditions on Venus, 156
Time Signal Adjustment, 283
Time Signals Adjusted, 155
Twin Chinese Comets, 223
Twinkle, Twinkle, Little Quasar, 26
Unexpected Increase in Meteor Counts, 156
Unusual Feature near Spiral Galaxy M81, 346
Where Did Cosmic Helium Originate? 88

Observer's Page–
Color-Film Processing, 187
Deep-Sky Wonders, 58, 124, 186, 253, 328, 390
Extreme Grazing Occultations, 386
High-Resolution Photography, 52
Jovian Atmospheric Feature of Special Interest, A, 118
Late-1964 Meteor Shower Roundup, 120
Lyrid Meteors Observed, 390
Moon and Distant Hills, The, 391
Observations of Eclipsing Variable Stars, 254

Observer's Page (cont.)–
Observing the Moon, Marius, 59; Milichius, 252
Occultations of Mercury and Beta Scorpii, December, 1964; correction to, 126
Pair of Well-Observed Grazing Occultations, A, 388
Photographing the Zodiacal Light, 323
Simple Antennas for Radio Time Signals, 326
Some Findings from Last December's Eclipse, 182
Some Observations of Noctilucent Clouds, 250
Star Trails and Seeing, 122
Sunspot Numbers, 59, 123, 187, 251, 327, 391
Training the Eye, 187
Unusual Lunar Eclipse Photograph, 389
Venus-Regulus Conjunction, 60

Rambling Through . . . (current month) Skies, 64, 128, 192, 260, 332, 396

Some Astronomical Anniversaries, 15, 96, 144, 211, 283, 352

Southern Stars, 66, 194

Stars for . . . (current month), 65, 129, 193, 261, 333, 397

Selected Topics and Celestial Objects

This listing is not intended to be exhaustive, and does not supplant the other parts of the index. For example, material in such regular features as Amateur Astronomers is ordinarily indexed only under the Departments and Features section.

Amateur astronomers: Bridgeport, Conn., 154; Dacca, Pakistan, 155; Leechburg, Pa., 288; meetings—Baden, Switz., 286; Leicester, Eng., 30

Artificial satellites and spacecraft: Atlas-Centaur, 95; Cosmos, 359; dynamical model, 16; Early Bird, 281, 360; Explorer 26, 96; Gemini, 152, 211, 279; Imp-1, 22, 357; list of launchings, 28; Mariner 4, 29, 95, 150, 211, 359; Molniya 1, 360; OSO 2, 151; Pageos, 210; Pegasus, 210; Ranger 8, 205; Ranger 9, 280; Snap-10A, 281; Tiros 9, 151; Titan, 95; Voskhod 2, 279; Zond 2, 29

Asteroids: Juno, 393; Pallas, 393; Roemera, 345

Atmosphere: density, 281; green flash, 85; layers, 27; noctilucent clouds, 250; sodium, 283

Clusters: globular—ω Centauri, 328; M2, 390; M3, 328; M4, 390; M5, 390; M53, 328; M68, 328; NGC 6522, 282; open—Perseus Double, 138; Pleiades, 356; M37, 141; M44, 186; NGC 2548, 186

Comets: 1965b and 1965c, 223

Conjunctions: Venus and Regulus, 60

Constants, astronomical: 19

Constellations: Bootes, 396; Corvus and Crater, 260; naked-eye magnitude limit, 14, 153, 192, 349; winter, 128

Cosmic rays: 226

Cosmology: 4, 81, 88, 145

Double stars: OΣ 359, 215; Σ742, 58; Σ1280, 124

Earth: magnetic pole, 224; magnetic tail, 357; Mohole, 355

Eclipses: December 18, 1964, lunar, 71, 72, 182, 389; May 30, 1965, solar, 86, 149, 224, 267, 330; June 13, 1965, lunar, 395; November 12, 1966, solar, 86

Elements, abundance of: helium, 88, 219; light, 347

Galaxies: evolution, 4, 81; Hercules cluster, 9; radio, 145; Seyfert sextet, 84; M31, 139, 140; M74, 7; M81, 346; M82, 145; NGC 175, 8; NGC 205, 82; NGC 488, 7; NGC 1073, 8; NGC 1201, 7; NGC 1300, 8; NGC 2403, 81; NGC 2523, 8; NGC 2525, 8; NGC 2811, 7; NGC 2841, 7; NGC 2859, 8; NGC 3031, 7; NGC 3190, 4; NGC 3395-6, 10; NGC 3675, 253; NGC 3877, 253; NGC 3938, 253; NGC 3949, 253; NGC 4189, 158; NGC 4214, 83; NGC 4321, 83; NGC 4374, 83; NGC 4567-8, 10; NGC 5544-5, 84; NGC 7332, 82

History: Argelander, F., 276; BD, 276; Herschel, W., 153; Korea, 229, 349; Parkhurst, H., 217; Rabe, W., 278; Rayleigh family, 77; selenography, 92; Tycho Brahe, 353

Image converters: availability, 26

International Astronomical Union: Hamburg meeting, 19; large-telescope symposium, 354

Jupiter: fast-moving spot, 118; photographs, 52, 214; radar observations, 339; radio observations, 27; rotation, 88; satellite eclipses, 157; satellite names, 85, 278

Light: speed of, 204

Mars: canals, 88; infrared spectrum, 282; in 1965, 150, 189; radar observations, 26

Mercury: radar observations, 339; radio observations, 218

Meteorites: 77; Canyon Diablo, 222; origin, 282

Meteors: artificial, 26; Canadian fireball, 278; counts, 120; increase, 156; Lyrid, 390; radio effects, 14

Milky Way (galaxy): center, 282; in Cygnus, 202; in Scorpius, 341; in Sagittarius, 213; interstellar matter, 18, 225; southern, 344; spiral shape, 281

Moon: Aristarchus, 91; colors, 85, 153; early studies, 92; Marius, 59; Milichius, 252; photographs, 52; pingos, 143; Ranger 7 maps, 230; Ranger 8, 204; Ranger 7-9 results, 293; surface layer, 345; Tycho, 364

Navigation: 340

Nebulae: Crab, 58; planetary—215, 281; NGC 7662, 85

Neutrino astronomy: 228

Novae: Herculis 1963, 142, 275

Observatories: Allegheny, 135; Harvard, 200; Kitt Peak, 268; Kvistaberg, 136; Mees, 346; Mount Wilson, 283; Owens Valley, 199

Observatories, amateur: Appleton, Wis., 231; Costa Mesa, Calif., 285; Fall River, Mass., 361; Kent Township, N. Y., 242; Old Bethpage, N. Y., 284; Rafaela, Arg., 284; Sarver, Pa., 284; Warren, Ohio, 285

Occultations: grazing, 330, 386, 388

Personal notes: Baldet, F., 283; Becvar, A., 140; Clemence, G., 223; Herget, P., 217; Hess, V. F., 94; Izsak, I., 345

Photography: eclipse, 215; high-resolution, 52; moon and hills, 391; patrol cameras, 200; star trails, 122

Planetariums: Armagh, Ireland, 283; Los Angeles, Calif., 149; Mystic, Conn., 215

Pluto: occultation by? 216; rotation, 141

Quasi-stellar sources: 6, 145; scintillation, 26

Radar and radio astronomy: amateur radio telescope, 212; Dutch antenna, 10; Jodrell Bank, 85; Jupiter, 27, 339; Mars, 26, 339; Mercury, 218, 339; Owens Valley, 199; radio spectra, 221; Sugar Grove, 346; Venus, 218, 281, 345, 356

Relativity: tests, 156

Saturn: photograph, 56

Solar system: Neptune and Pluto, 157; positions, 158

Spectroscopy: plasma torch, 144; with infrared interferometer, 79

Stars: colors, 332; distance modulus, 274; infrared halos, 158; infrared spectra, 78; neutron, 345; Zeta Tauri, 219

Sun: energy spectrum, 162; flares, 89; sunspot minimum, 158

Supernovae: 157, 283; A. D. 1006, 219

Telescopes and telescope making: dual-field, 112; elbow, 178; equatorial adjustment, 180; figuring large mirrors, 350; grinding machine, 176; Isaac Newton, 350; large reflectors, 3, 354; 150-inch reflector, 140, 268; remote-reading circles, 44; Ronchi testing, 382; schiefspiegler, 248; Schmidt-Cassegrain, 318, 380; 16-inch reflector, 242; 39-inch Schmidt, 136

Time signals: antennas for, 326

Variable stars: Andrews' star, 62; IAU notes, 21; RT Andromedae, 254; XZ Andromedae, 254; CX Aquarii, 254; OO Aquilae, 254; WW Aurigae, 255; SV Camelopardalis, 255; RZ Cassiopeiae, 255; TV Cassiopeiae, 255; U Coronae Borealis, 153, 190; SZ Herculis, 255; SZ Hydrae, 126; R Lyrae, 258; FL Lyrae, 330; β Persei, 255; V505 Sagittarii, 255; X Trianguli, 255; BV 312, 255; BV 382, 393; BV 544, 89; BV 623, 345

Venus: clouds, 224; radar observations, 281, 356; radio studies, 345; rotation, 356; surface conditions, 156

X-ray astronomy: 226

Zodiacal light: 323

Sky and TELESCOPE

INDEX to Volume XXX

July to December, 1965

Titles

American Astronomers Report—
Bosomtwe: An African Meteorite Crater? 15
Clue to Jupiter's Decametric Radiation, A, 275
Icarus and General Relativity, 211
Jupiter's Satellites and its Radio Noise, 14
Light Echoes from Ancient Supernovae, 211
Omega Piscium, 14
Pluto's Diameter, 213
Relativity and Solar Evolution, 275
Search for Cosmic Light, 211
Shower Micrometeorites Collected by Balloon, 276
Temperature Measurements of Mars, 213
Ultraviolet Excess and Atmospheric Turbulence, 275
Updating a Blueprint for American Astronomy, 212
Variable Radio Emission from Quasars, 277
Arizona-Tonantzintla Catalogue, The, 24
Charting the Martian Surface, *Gerard de Vaucouleurs*, 196
China's Largest Meteorite, *Chou Ming*, 347
Comet Ikeya-Seki, 331
Convention Highlights from Reno, *Alan McClure* and *Leif J. Robinson*, 206
Convention in Milwaukee, *W. E. S.*, 132; correction, 221
Dual-Fueled Booster Titan 3C, The, *Raymond N. Watts, Jr.*, 86
Eclipse Expeditions on Manuae Atoll, *Frank M. Bateson*, 78
Edgewise Presentation of Saturn's Rings, The, *Joel W. Goodman*, 128
Explorer of the Milky Way, *Donald A. MacRae*, 7
Extremely Cool Stars, 195
Finest Deep-Sky Objects, The, *James Mullaney* and *Wallace McCall*, 280; II, 356
First Eclipse Reports, 3
Five-Color Photometry of Bright Stars, *Braulio Iriarte, Harold L. Johnson, Richard I. Mitchell*, and *Wieslaw K. Wisniewski*, 21
Further Notes on the Eclipse, 150
Galactic X-Ray Astronomy, *C. Stuart Bowyer*, 264
Gemini Program Sets Space Records, *Raymond N. Watts, Jr.*, 214
Great Comet of 1965, The, *Brian G. Marsden*, 332
Great Swedish Astronomer, A, *Thornton L. Page*, 142
Harlow Shapley Is 80, 263
Instruments for the New Celestial Navigation, *Saul Moskowitz*, 348
Light Elements in Stellar Atmospheres—II, *Margherita Hack*, 9
Mariner 4 Completes Mars Mission, *Raymond N. Watts, Jr.*, 136; correction, 201
Mariner 4 Photographs of Mars, 155; correction, 201
Month of Notable Space Advances, A, *Raymond N. Watts, Jr.*, 17; correction, 87
Most Remote Objects Ever Identified, The, 16
Mount Cuba Observatory in Delaware, *Leo G. Glasser*, 4
New 140-foot Radio Telescope, The, *Maxwell M. Small*, 267
1966 Occultation Supplement—Predictions for the United States and Canada, 291
Notes on Some Planetary Problems, *Beverly T. Lynds*, 80
Observing the Eclipse from Peru, *Andrew Michalitsanos* and *Steven Goldstone*, 76
OGO 2 Satellite in Orbit, *Raymond N. Watts, Jr.*, 353
Photographs of Comet Ikeya-Seki, 343
Quasi-Stellar Galaxies, 67
Radio Astronomers Detect Another Hydrogen Line, 127
Rich Harvest of Comets, A, 284
Rotatable Telescope for Polarization Studies, A, *W. A. Hiltner* and *Rudolph Schild*, 144
Space Astronomy at the World's Fair—II, *Peter A. Leavens*, 68
Space Notes, *Raymond N. Watts, Jr.*, 285
Spectrum of Satellite Echo 1, A, *A. Przybylski*, 217
Strange Story of Comet de Vico-Swift, The, *Brian G. Marsden*, 139; correction, 254
Sundial Monument, A, *Hermann Egger*, 220
Thirty-Six Miles in the Shadow, *Arthur N. Cox, Donald H. Liebenberg*, and *Sidney N. Stone*, 72
Thoughts About Constellation Figures, *O. Richard Norton*, 203
Western Satellite Research Network, *G. A. McCue, J. G. Williams*, and *R. C. Hoy*, 88
Zond-3 Photographs of the Moon's Far Side, *Yuri N. Lipsky*, 338

Authors

Abbot, Charles G., letter, 360
Albers, Henry, book review, 164
Ashbrook, Joseph, Astronomical Scrapbook, 83, 202, 355
Three Lunar Observing Problems, 56
Ashbrook, Martha D., book review, 96
Barricelli, Nils Aall, letter, 75
Bateson, Frank M., Eclipse Expeditions on Manuae Atoll, 78
Bennett, Brenton, A Camera Adapter for Eyepiece Projection Photography, 378
Both, Ernst E., book review, 235
Bowyer, C. Stuart, Galactic X-Ray Astronomy, 264
Brandl, Karl, A War-Surplus Observatory in Germany, 221
Burke, Bernard F., book review, 237
Burke, Edward W., Jr., and *William W. Rolland*, A New Observatory at King College in Tennessee, 172
Busler, William J., How To Find It: Messier 27, 182; Messier 79, 391
C. A. F., see *Federer, Charles A., Jr.*
Carr, Stanley D., Michigan Amateurs Build Observatory, 44
Chou Ming, China's Largest Meteorite, 347
Comello, G., book review, 37
Cox, Arthur N., Donald H. Liebenberg, and *Sidney N. Stone*, Thirty-Six Miles in the Shadow, 72
Cox, Robert E., conductor, Gleanings for ATM's, 41, 104, 172, 243, 308, 375
Notes on the Cassegrain Secondary, 375
Training of Optical Technicians, The, 41
Verniers for Setting Circles, 104
Cragg, Thomas A., book review, 303
Danby, J. M. A., book review, 371
de Vaucouleurs, Gerard, Charting the Martian Surface, 196
Dunham, David W., Occultation Highlights—September-November, 1965, 186; December-February, 1965-66, 394
Egger, Hermann, A Sundial Monument, 220
Federer, Charles A., Jr., Rambling Through . . . (current month) Skies, 60, 120, 188, 256, 324, 396
Feuillebois, G., Scarce Magazines Wanted, 20
Gagan, James W., The Silvertooth Method of Working a Cassegrain Secondary, 308
Gaposchkin, Sergei, letter, 138
Gasteyer, Charles, book review, 163
Gingerich, Owen, book reviews, 97, 367
Glasser, Leo G., Mount Cuba Observatory in Delaware, 4
Glenn, William H., Meteors, 58, 120, 254, 322, 393
Sun, Moon, and Planets This Month, The, 59, 119, 187, 255, 323, 395
Goldstone, Steven, see *Michalitsanos, Andrew*
Goodman, Joel W., The Edgewise Presentation of Saturn's Rings, 128
Gundermann, Ellen J., book review, 301
Hack, Margherita, Light Elements in Stellar Atmospheres—II, 9
Halliday, Ian, letter, 12
Hardie, Robert H., book review, 35
Harkins, Dora, letter, 138
Harlan, Eugene A., Celestial Photography at Different Wavelengths, 314
Heath, Alan W., A Sixty-Dollar Observatory, 359
Herring, Alika K., Observing the Moon, Kepler, 50; Piton, 251
Unusual Observation of Plato, An, 184
Hers, Jan, A Battery-Powered Transistor Oscillator Drive, 243
Hiltner, W. A., Rudolph Schild, A Rotatable Telescope for Polarization Studies, 144
Houston, Walter Scott, Deep-Sky Wonders, 52, 113, 252, 316, 389
Hoy, R. C., see *McCue, G. A.*
Iriarte, Braulio, Harold L. Johnson, Richard I. Mitchell, and *Wieslaw K. Wisniewski*, Five-Color Photometry of Bright Stars, 21
Irwin, John B., book review, 95
J. A., see *Ashbrook, Joseph*
Johnson, Harold L., see *Iriarte, Braulio*
Kelly, Allan O., letter, 360
Kimball, Donald S., book review, 305
Kozyrev, N. A., letter, 360
Kraus, Michael, book review, 168
Kreimer, Evered, Experiments in Cooled-Emulsion Photography, 384
Krienke, Karl, An Unusual Observation of Echo 1, 389
Kuhn, William A., A Homemade Telescope and Mounting for a 6-inch Lens, 46
L. J. R., see *Robinson, Leif J.*
Leavens, Peter A., Space Astronomy at the World's Fair—II, 68
Liebenberg, Donald H., see *Cox, Arthur N.*
Lipsky, Yuri N., Zond-3 Photographs of the

Moon's Far Side, 338
Lynds, Beverly T., Notes on Some Planetary Problems, 80
Macosko, Andrew, High School Astronomy Club in McKeesport, 91
MacRae, Donald A., Explorer of the Milky Way, 7
Mallas, John H., letter, 75
Marsden, Brian G., The Great Comet of 1965, 332
The Strange Story of Comet de Vico-Swift, 139; correction, 254
Mathews, Robert T., book review, 302
McAllister, E. Lyle, letter, 360
McCall, Wallace, see *Mullaney, James*
McClure, Alan, and *Leif J. Robinson,* Convention Highlights from Reno, 206
McCue, G. A., J. G. Williams, and *R. C. Hoy,* Western Satellite Research Network, 88
McInnis, Frank G., Amateurs Exhibit at Charlotte, 286
McIntosh, R. A., letter, 75
Meeus, Jean, letters, 12, 360
Meisel, David, book review, 34
Merrill, John E., book review, 101
Michalitsanos, Andrew, and *Steven Goldstone,* Observing the Eclipse from Peru, 76
Mitchell, Richard I., see *Iriarte, Braulio*
Moskowitz, Saul, Instruments for the New Celestial Navigation, 348
Mullaney, James, and *Wallace McCall,* The Finest Deep-Sky Objects, 280; II, 356
Mumford, George S., News Notes, 13, 84, 140, 218, 278, 352
Norton, O. Richard, Thoughts About Constellation Figures, 203
Olivarez, Jose, Visibility of Nebulae, 221
Page, Thornton L., A Great Swedish Astronomer, 142
book review, 370
Ploran, Karl W., letter, 75
Przybylski, A., A Spectrum of Satellite Echo 1, 217
R. E. C., see *Cox, Robert E.*
Reese, Elmer J., Jupiter's Equatorial Zone Returns to Normal Brightness, 317
Robinson, Leif J., Some Double Stars for Low-Power Viewing, 54
Two Summer Meteor Showers, 248
see also *McClure, Alan*
Robinson, Paul, Plans for a Large Reflector in New Jersey, 286
Rolland, William W., see *Burke, Edward W., Jr.*
Schild, Rudolph, see *Hiltner, W. A.*
Secretan, Luc, A Mechanical Variable-Speed Drive, 43
Shartle, Stanley M., A Very Rigid Pier, 246
Shawcross, William E., AAVSO Fall Meeting Held at Harvard Observatory, 359
Biggest Stellafane Ever, The, 148
Convention in Milwaukee, 132; correction, 221
Simpson, Clark C., letter, 138
Small, Maxwell M., The New 140-foot Radio Telescope, 267
Solomon, Leonard H., letter, 12
Steeg, Richard, A Teen-Ager's First Telescope—A Dall-Kirkham, 107
Stone, Sidney N., see *Cox, Arthur N.*
Storer, N. Wyman, book review, 165
Thomson, Malcolm M., book review, 38
van der Brugge, A. H., Dutch Telescope Making, 92
Veio, Fredrick, Photographic Limiting Magnitudes, 114
W. E. S., see *Shawcross, William E.*
W. H. G., see *Glenn, William H.*
Watts, Raymond N., Jr., Dual-Fueled Booster Titan 3C, The, 86
Gemini Program Sets Space Records, 214
Mariner 4 Completes Mars Mission, 136; correction, 201
Month of Notable Space Advances, A, 17; correction, 87
OGO 2 Satellite in Orbit, 353
Space Notes, 285
Williams, J. G., see *McCue, G. A.*
Wisniewski, Wieslaw K., see *Iriarte, Braulio*
Wyatt, Stanley P., book reviews, 32, 99
Yajko, Robert A., Jupiter and the Crescent Moon, 54
Zissell, Ronald E., Observations of CY Aquarii, 391
Zwicky, Fritz, letter, 360

Departments and Features

Amateur Astronomers—
AAVSO Fall Meeting Held at Harvard Observatory, 359
AAVSO To Meet at Harvard Observatory, 221
Amateur Briefs, 20, 91, 148, 222, 286, 359
Amateurs Exhibit at Charlotte, 286
Astronomy at the Adler Planetarium, 221
Biggest Stellafane Ever, The, 148
Dutch Telescope Making, 92
Great Lakes Meeting Held, 221
High School Astronomy Club in McKeesport, 91
Joint Meeting Held in Canada, 20
Middle East Meeting Held, 149
Northeast Regional Meeting Held, 20
Ohio Amateurs Meet, 149
Optical Division Journal, 20
Plans for a Large Reflector in New Jersey, 286
Scarce Magazines Wanted, 20
Sixty-Dollar Observatory, A, 359
Society Listing, 20
Some National Amateur Organizations, 286
Visibility of Nebulae, 221
War-Surplus Observatory in Germany, A, 221
Astronomical Scrapbook—
Earth's Shape, The, 83
Fauth Moon Atlas, The, 202
Long Career of J. G. Galle, The, 355
Books and the Sky—
All About the Universe, David Dietz, 96
Astronomy, Samuel Rapport and Helen Wright, editors, 163
Astrophysics and Space Science, Allen J. McMahon, 35
Bibliographie Générale de l'Astronomie Jusqu'en 1880, J. C. Houzeau and A. Lancaster, 367
Catalogue of Galaxies and of Clusters of Galaxies, F. Zwicky, 99
Foundations of Astrodynamics, Archie E. Roy, 371
Fundamental Astrometry, V. V. Podobed, 38
Galileo Galilei, Ludovico Geymonat, 97
Keoeeit—The Story of the Aurora Borealis, William Petrie, 305
Landolt-Börnstein Astronomy and Astrophysics, H. H. Voigt, editor, 95
Meteors, Comets, and Meteorites, Gerald S. Hawkins, 37
Nature of the Planets, The, V. V. Sharonov, 235
Nebulae and Galaxies, Giorgio Abetti and Margherita Hack, 370
Physical Characteristics of Comets, S. K. Vsekhsvyatskii, 34
Physics of Nonthermal Radio Sources, Stephen P. Maran and A. G. W. Cameron, editors, 301
Pictorial Guide to the Planets, Joseph H. Jackson, 164
Radio Astronomy and How To Build Your Own Telescope, John Heywood, 237
Reference Catalogue of Bright Galaxies, Gerard de Vaucouleurs and Antoinette de Vaucouleurs, 32
Solar System and the Constellations, The, Clifford N. Anderson, 168
Sunspots, R. J. Bray and R. E. Loughhead, 303
Universe and Its Origin, The, H. Messel and S. T. Butler, editors, 302
Wanderers in the Sky, Thornton Page and Lou Williams Page, editors, 165
We Are Not Alone, Walter Sullivan, 101
Celestial Calendar—
Algol—A Naked-Eye Eclipsing Variable, 393
Alpha Herculis—A Semiregular Variable, 58
August Occultation of Sigma Sagittarii, The, 118
Bright Asteroid Vesta Nears Opposition, 322
CY Aquarii: A Very Rapid Variable, 254
Gamma Cassiopeiae, 119
Jupiter's Galilean Satellites, 254
Jupiter's Satellites, 187, 255, 323, 395
Meteors, 58, 120, 254, 322, 393
Minima of Algol, 58, 119, 188, 254, 323, 393
Moon Phases and Distances, 58, 119, 188, 254, 322, 396
Occultation Highlights—September-November, 1965, 186; December-February, 1965-66, 394
Occultation of Eta Leonis, 322
Phase of Venus, 322
Satellites of Saturn, The, 185
Season for Minor Planet Ceres Opens, 118
Sun, Moon, and Planets This Month, The, 59, 119, 187, 255, 323, 395
Variable Star Maxima, 59, 119, 187, 254, 324, 396
Venus and Mercury as a "Double Planet," 59
Front-cover photographs—
Comet Ikeya-Seki, 329
Delaware's New Observatory, 1
Green Bank 140-foot Telescope, 261
King College Observatory, 125
New Zealand Eclipse Painting, 193
World's Fair Museum of Science, 65
Gleanings for ATM's—
Battery-Powered Transistor Oscillator Drive, A, 243
Camera Adapter for Eyepiece Projection Photography, A, 378
Homemade Telescope and Mounting for a 6-inch Lens, A, 46
Mechanical Variable-Speed Drive, A, 43
Michigan Amateurs Build Observatory, 44
New Observatory at King College in Tennessee, A, 172
Notes on the Cassegrain Secondary, 375
Silvertooth Method of Working a Cassegrain Secondary, The, 308
Teen-Ager's First Telescope—A Dall-Kirkham, A, 107
Training of Optical Technicians, The, 41
Verniers for Setting Circles, 104
Very Rigid Pier, A, 246
Here and There with Amateurs, 226
In the Current Journals, 13, 84, 141, 218, 279, 352
Letters, 12, 75, 138, 360
New Books Received, 39, 102, 169, 240, 306, 372
News Notes—
"Age" of Radio Source 1934-63, The, 150
American Astronomical Society To Meet in Michigan, 83
Analysis of an Extragalactic Star, 140
Chinese Meteorite, 278
Color Changes on Mars, 13
Decreased Solar Radiation, 140
Earth's "Cold Pole," 13
Extremely Red Star, An, 279
Fast-Moving Faint Binary, 218
Griffith Observatory, 19
Hawaiian 84-inch Reflector, 353
Improved Pendulum Astrolabe, 85
Infrared Spectra of Saturn's Rings and Jupiter's Satellites, 278
JILA Visiting Fellowships, 279
Jovian Rotation Rates, 13; correction, 87
Jupiter Authority, 147
Large Telescope for Hawaii, 140

Leuschner Observatory To Move, 352
Life in an Ammonia-Rich Atmosphere, 84
Molecular Oxygen in the Atmosphere of Venus, 278
Moon's Distance, 84; correction, 319
Mount John Observatory, 141
New Evidence for Early Life, 84
New Government Science Agency, 353
Orbital Motion of Polaris, 218
Photography of Faint Stars, 352
Possible Star Exchanges Between Galaxies, 218
Rate of Infall of Giant Meteorites, 352
Slow Nova in Auriga, 84
Smithsonian Space Science Conferences, 71
Solar Constant Studies Needed for Spacemen, 219
Structure of 3C-273, 84
Supernova of 1054—A Double Star? 140
Trees, Carbon-14, and the Sunspot Cycle, 279
Ultraviolet Spectrum of Mars, 201
Unusual Feature near Spiral Galaxy M81: Addendum, 141
V Sagittae, 13

Observer's Page—
Celestial Photography at Different Wavelengths, 314
Comet Alcock (1965h), 320
Dark Markings near the Sun's Poles, 249
Deep-Sky Wonders, 52, 113, 252, 316, 389
Experiments in Cooled-Emulsion Photography, 384
Finder Charts for Eclipsing Variables, 56
How To Find It: Messier 27, 182; Messier 79, 391
July Conjunction of Venus and Mercury, The, 179
June's Partial Lunar Eclipse, 110
Jupiter and the Crescent Moon, 54
Jupiter's Equatorial Zone Returns to Normal Brightness, 317
Many View the August Occultation of Nunki, 318
May Sunspot Groups, 115
News from Occultation Observers, 390
Observation of a Partial Occultation of Jupiter, 250
Observations of Callisto and BD +22°1032, 390
Observations of CY Aquarii, 391
Observing the Moon, Kepler, 50; Piton, 251
Photographic Limiting Magnitudes, 114
Some Double Stars for Low-Power Viewing, 54
Strip-Chart Recorders, 53
Sunspot Numbers, 53, 115, 183, 250, 320, 388
Three Lunar Observing Problems, 56
Two Summer Meteor Showers, 248
Unusual Observation of Echo 1, An, 389
Unusual Observation of Plato, An, 184

Planetarium Notes, 151

Rambling Through . . . (current month) Skies, 60, 120, 188, 256, 324, 396

Some Astronomical Anniversaries, 8, 92, 138, 222, 279, 351

Southern Stars, 122, 258, 398

Stars for . . . (current month), 61, 121, 189, 257, 325, 397

Selected Topics and Celestial Objects

This listing is not intended to be exhaustive, and does not supplant the other parts of the index. For example, material in such regular features as Amateur Astronomers is ordinarily indexed only under the Departments and Features section.

Amateur astronomers: McKeesport, Pa., 91; Ohio, 149; satellite tracking, 88; meetings—Cambridge, Mass., 359; Milwaukee, Wis., 132; Paxton, Mass., 20; Reno, Nev., 206; Stellafane, 148; Toronto, Ont., 20
Artificial satellites and spacecraft: amateur tracking, 88; Cosmos 91, 285; Echo 1, 217, 389; eight at once, 87; Gemini 4, 17; Gemini 5, 214, 215; Gemini 6, 285; Geos 1, 354; Imp 3, 18; Luna 5, 19; Luna 6, 19; Luna 7, 285; Mariner 4, 136, 155, 285; OGO 2, 353; Pegasus 2, 18; Pegasus 3, 215; Titan 3C, 86; Zond 2, 19; Zond 3, 215, 285, 338
Asteroids: Ceres, 118; Icarus, 211; Vesta, 322
Balloon astronomy: 276
Clusters: finest, 280, 356; globular—M3, 357; M13, 52, 358; M30, 252; M56, 113; M72, 252; M75, 252; M79, 391; M92, 52; NGC 6229, 52; open—M37, 283; M46, 283; M67, 283; NGC 1647, 389; pseudo—M73, 252
Comets: Alcock (1965h), 320; de Vico-Swift (1965e), 139; Giacobini-Zinner (1965g), 285; Ikeya-Seki (1965f), 284, 331, 332, 343; Temple-Tuttle (1965i), 285
Conjunctions: Callisto and BD +22°1032, 390; Jupiter and moon, 54; Venus and Mercury, 59, 179
Constellations: Capricornus, 188; figures, 203; Hercules, 60; Milky Way, 396; Pisces, 324; planets and constellation study, 120; super-constellations, 256
Cosmic light: 211
Double and multiple stars: finest, 280, 356; for binoculars, 54; G175-34, 218; γ Leonis, 357; ω Piscium, 14; Polaris, 218; Σ2094, 53
Earth: antarctic temperatures, 13; proofs of shape, 83
Eclipses: May 30, 1965, solar, 3, 72, 75, 76, 78, 150; June 13-14, 1965, lunar, 110
Galaxies: compact, 360; double, 218; finest, 280, 356; quasi-stellar, 67; M31, 280, 389; M33, 389; M74, 316; M81, 141, 356; M82, 356; NGC 254, 280; NGC 4782-3, 219; NGC 5364, 143; NGC 6207, 52, 252
Geodesy: pendulum astrolabe, 85; satellite for, 354
History: earth's shape, 83; Fauth, P., 202; Galle, J. G., 355; Lomonosov, M. V., 138
Jupiter: 147; equatorial-zone changes, 317; radio noise, 14, 275; rotation, 13; satellites, 278
Life: earliest, 84; extraterrestrial, 84
Mars: 360; charting, 196; color changes on, 13; in 1965, 80; Mariner 4, 136, 155; temperature, 213; ultraviolet spectrum, 201
Mercury: atmosphere, 360
Meteorites: Bosomtwe crater, 15; Chinese, 278, 347; infall rates, 352; micrometeorites, 276
Meteors: observations, 248
Moon: Aristarchus, 202; distance, 84, 319; dust layer, 75; far side, 215, 338; Fauth atlas, 202; Kepler, 50; meteoritic impacts, 352; observing problems, 56; photography, 378; Piton, 251; Plato, 184
Navigation: space, 348
Nebulae: finest, 280, 356; visibility, 221; Crab, 264; Dumbbell, 182; North America, 113; Orion, 281, 282; Ring, 113; Saturn, 252; M8, 314; M20, 314; NGC 6210, 53
Novae: S 5420 Aurigae, 84
Observatories: Bristol, Tenn., 172; Griffith, 19; in Hawaii, 140, 353; Leuschner, 352; Lowell, 80; Mount Cuba, 4; Mount John, 141; National Radio Astronomy, 267; needs of American, 212; Saltsjöbaden, 143
Observatories, amateur: Long Eaton, Eng., 359; Munich, Ger., 221; Muskegon, Mich., 44; New Jersey, 286
Occultations: bright stars, 12; news, 390; Nunki, 118, 318; partial—of planets, 250, 360
Personal notes: Lindblad, B., 142; Nassau, J. J., 7; Peek, B. M., 147; Shapley, H., 263
Photography: cooled emulsion, 384; eyepiece projection, 378; faint stars, 352; in various wavelengths, 314; limiting magnitudes, 114
Photometry: photoelectric, 21
Pluto: diameter, 213; occultation by? 12
Puzzles: 75, 360
Quasi-stellar sources: 16; 1934-63, 150; 3C-273, 84, 277
Radar and radio astronomy: hydrogen recombination line, 127; Mars, 213; moon's distance, 84; 140-foot telescope, 267
Relativity: 211, 275
Satellites: (see Artificial satellites)
Saturn: rings, 128, 278; satellites, 185
Solar system: planetary problems, 80
Space astronomy: (see also Artificial satellites and spacecraft); at World's Fair, 68; navigational instruments, 348; Smithsonian conference, 71
Spectra: Echo 1, 217
Stars: composition of an extragalactic, 140; extremely cool, 195, 279; light elements in, 9; magnitudes of 1,325, 21; polarization, 144; ultraviolet excesses, 275
Sun: May spot groups, 115; polar markings, 249; radiation, 140, 219, 360; spots and tree rings, 279
Sundials: 220
Supernovae: A. D. 1054, 140; light echoes, 211
Telescopes and telescope making: at Stellafane, 148; Cassegrain secondary, 308, 375; Dall-Kirkham, 107; Dutch off-axis, 92; 84-inch reflector, 140; rigid pier, 246; 6-inch refractor, 46; strip-chart recorders, 53; training optical technicians, 41; transistorized drive, 243; 12½-inch Newtonian, 172; 24-inch Harvard, 308; 24-inch rotatable, 144; variable-speed drive, 43; verniers, 104
Variable stars: charts, 56; CY Aquarii, 254, 391; TX Camelopardalis, 279; γ Cassiopeiae, 119; α Herculis, 58; β Persei, 393; V Sagittae, 13
Venus: oxygen? 278; phases, 322
X-ray astronomy: 264